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Application Note

Recording Level in the Floating Marshes of Terrebonne Parish, Louisiana

Terrebonne Parish, in southeast Louisiana, is home to many "floating marshes," which are commonly called "quaking mats." Floating marshes consist of a mat of freshwater marsh vegetation on top of a layer of water. The vegetation grows on a layer of highly organic substrate. The different species and thickness of the vegetation determine the buoyancy of the mat. At certain times of year the water level decreases and the vegetation mat lowers; during other times of the year the marsh floods and the vegetation mat floats higher.

After state and federal agencies completed mapping of the entire state, the Louisiana Department of Natural Resources (LaDNR) realized that many more floating marshes existed than it previously believed. Because there was very little data on the formation of these floating marshes, the LADNR is finding new techniques to obtain data using YSI's multiparameter water quality monitoring systems. One of the monitored floating marshes is part of the Brady Canal Hydrologic Restoration Project. This project is part of the response to the amount of land being converted to open water annually. In this project area, between the years 1932 and 1990, approximately 1,818 acres were converted into open water.

YSI instruments monitor level

There are several reasons for water level fluctuation including natural subsidence, an increase in oil field access by building canals throughout the marsh systems, and the channelization of the Mississippi River. The river levees stopped major arteries from bringing sediment and nutrients into the area, which caused a drop in freshwater and sediments. The lack of sediment accretion allows freshwater to drain out and the saltwater to flow in to many areas, creating more open water. Goals of the Brady Canal project include reducing tidal exchange and retaining freshwater and sediment. Monitoring the floating marsh will help managers understand how at some point during situations the mat will respond. LADNR Natural Resources Geoscience Specialist Jennifer Young collects and evaluates the data that is collected at the floating marsh. At two sites, boardwalks were constructed into the marsh and a hole was punctured in the vegetative mat. Ms. Young uses two YSI 600XLM sondes or "Marsh Mat Recorders," as she refers to them. The sondes are lowered and deployed through the holes and into the water under the mat. The sondes collect vented level, specific conductance, salinity, and temperature data. The areas around the marsh are also monitored for the same parameters using YSI sondes such as the YSI 6920. This data is used to compare to the data collected from under the mat and also to record trend data for the entire marsh.

Young visits the YSI sondes once a month to upload the data using a YSI multiparameter display unit. She makes certain that the depth ports of the sondes stay free of biofouling. The water under the floating mat is much cleaner than the rest of the marsh; hence the YSI 600XLM sondes require very little maintenance. The data that is collected under the mat and in the rest of the marsh is evaluated so that decisions can be made on several actions that will help stop the loss of land to open water as well as provide the LADNR with information on the phenomenon of the "floating marsh."

Aerial view of the marshes in Terrebonne Parish.

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